



U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

Smart Grid Activities at the Department of Energy

Presented to FERC-NARUC Collaborative Leadership

May 7, 2008



Presentation Outline

- **OE Requirements on Implementing EISA 2007, Title XIII – Smart Grid**
- **Status Updates on OE Actions**
 - **Electricity Advisory Committee**
 - **Federal Smart Grid Task Force**
 - **Defining Smart Grid**
 - **Smart Grid Implementation Workshop**
 - **Reports to Congress**
 - **Interoperability Framework**
 - **Smart Grid Public Awareness**
- **OE R&D Programs supporting achievement of Smart Grid functions**
- **OE PSA & EERE activities supporting smart grid implementation**





OE Requirements on Implementing Title XIII Smart Grid Requirements

- **Establish a Smart Grid Advisory Committee**
- **Establish a Smart Grid Task Force**
- **Submit to Congress a report concerning the status of Smart Grid system deployments**
- **Submit to Congress a study assessing laws and regulations affecting siting of privately owned electricity distribution wires on and across public rights-of-way**
- **Submit to Congress a quantitative assessment concerning the security implications of Smart Grid system deployments**
- **Carry out a program to research, develop, and demonstrate Smart Grid technologies**
- **Establish a Smart Grid regional demonstration initiative showcasing advanced technologies**
- **Establish a federal matching funds program**





Electricity Advisory Committee

(1st meeting scheduled on May 20, 2008)

- Advise on reliability, security and policy issues
- Review programs and initiatives
- Advise on current and future capacity
- Identify emerging issues related to capacity, production, delivery, reliability, security and regulation
- Advise on coordination between DOE, State, regional officials, and the private sector on supply, demand, and reliability
- Advise on coordination between Federal, State, and utility industry in the event of disruption or emergency





Electricity Advisory Committee Members

- Linda Stuntz – Stuntz, Davis & Staffier Chair
- Guido Bartels – IBM
- Gerry Cauley – Southeast Electric Reliability Council
- Ralph Cavanagh – NRDC
- Jose Delgado – ATC
- Jeanne Fox – NJ PUC
- Joseph Garcia – National Congress of American Indians
- Robert Gramlich – American Wind Energy Association
- Dian Grueneich – CPUC
- Michael Heyeck – AEP
- Hunter Hunt – Sharyland Utilities
- Susan Kelly – APPA
- Irwin Kowenski – Occidental Energy Ventures Corp
- Barry Lawson - NRECA
- Yakout Mansour - CAISO
- Ralph Masiello – KEMA
- Steve Nadel – ACEEE
- David Nevius – NERC
- Brad Roberts – ESA
- Enrique Santacana – ABB
- Tom Sloan – KS Representative
- Barry Smitherman – TX PUC
- Tom Standish – CenterPoint Energy
- Robert Thomas – Cornell University
- Vickie Van Zandt – BPA
- Bruce Walker – ConEd
- Jonathan Weisgall – MidAmerican
- Malcolm Woolf – MD Energy Administration



Smart Grid Task Force

Functions

- Serves as Federal focal point on all things “smart grid”
- Coordinates and integrates inter-governmental activities
- Oversees report production for submission to Congress
- Oversees development of smart grid RD&D plan
- Collaborates on interoperability framework
- Collaborates with and supports the Electricity Advisory Committee
- Subject to future appropriations
 - Guides smart grid regional demonstrations
 - Guides establishment of federal matching funds program





Smart Grid Task Force

Functions (cont)

- Insures awareness of Federal smart grid activities
 - Research and development
 - Standards and protocols
 - Relationship of smart grid technologies and practices to
 - Infrastructure development
 - System reliability
 - Security,
 - Demand response
 - Transmission
 - Distribution
 - Policy, and
 - Other facets of electricity supply





Task Force Composition

Organization	Members	Roles
OE	Eric Lightner, Director Hank Kenchington Larry Mansueti Philip Overholt	Leadership Cyber Security, State Policy Transmission R&D
EERE	Dan Ton Paul Dickerson	Energy efficiency & renewables
NETL	Steve Bossart	NETL/FE
DHS	Roger McGinnis, Sr. Patrick Murphy	Homeland security
EPA	Stacy Angel	Environmental issues
FERC	David Andrejcak Ray Palmer	Wholesale markets
NIST	William Anderson Jerry FitzPatrick	Interoperability standards
USDA	Georg Shultz Joe Badin	Rural electricity development
DoD	Invited	National security



Defining Smart Grid

Electricity delivery network modernized using latest digital/information technologies to meet key defining functions*

- Enabling active participation by consumers
- Accommodating all generation and storage options
- Enabling new products, services, and markets
- Optimizing assets and operating efficiently
- Anticipating and responding to system disturbances in a self-healing manner
- Operating resiliently against physical and cyber attack and natural disasters
- Providing the power quality for the range of needs in a digital economy

The evolution of a smart grid will be one of continuous improvement.

* Identified through the NETL Modern Grid Strategy Team efforts



Smart Grid Implementation Workshop

Planned for June 19-20, 2008, in DC, with broad stakeholder engagement to reach consensus on and acceptance of:

- Smart Grid characteristics and values
- Metrics for measuring progress toward a smart grid
- Measurement and verification



Input to:

- Smart Grid baseline and progress tracking
- Smart Grid RD&D Plan development
- Soliciting and selecting smart grid regional demo activities (subject to appropriations)

A Planning Committee comprising a broad representation of smart grid stakeholders is being charged to organize the Workshop.



Reports to Congress:

Section 1302 Smart Grid System Report

Requirements

- Current status and prospects of smart grid deployment
- ID of any regulatory or government barriers
- Recommendations for State/Federal policies or actions (optional)
- Analysis taking a regional perspective

Approach

- Building on Implementation Workshop findings (data, methodologies, and metrics) to guide smart grid status and projection analyses
- Leveraging the APQC maturity model to assess key performance indicators of smart grid functions/practices
- Working with FERC-NARUC Smart Grid Collaborative to ID regulatory policies and on suggested recommendations

Status

- SOW developed and reviewed by Task Force
- Key milestones identified for on-schedule completion for DOE submittal by 12/19/08
- Lead Contractor: PNNL (incl. subcontract to APQC)



Reports to Congress:

Section 1308 Effect of Private Wire Laws on Development of CHP Facilities

Requirements

- Consult with States and other entities
- Evaluate purposes and effect of the laws
- Determine impact of changing laws and regulations
- Assess extent of duplication or redundancy due to privately owned wires

Approach

- Assemble project review team
- ID 4-8 key states for in-depth analysis
- Develop interview questions/issues
- Conduct 6-10 interviews in each category:
 - With vendors/developers
 - With regulators and utilities
- ID alternatives to CHP ownership of wires

Status

- SOW developed with key Tasks defined
- On-schedule completion for DOE submittal by 12/19/08
- Lead Contractor: Navigant Consulting



Reports to Congress:

Section 1309 Security Attributes of Smart Grid Systems

Requirements

- Assess and determine impact of smart grid deployments on infrastructure security and operations
- Recommend on how smart grid can help in:
 - Reduced vulnerability
 - Restoration
 - Coordinated emergency responses
- Recommend on risk mitigation

Approach

- Work in coordination with DHS/FERC/NERC on SOW development

Status

- In early stages of planning
- Report due 6/19/09

Smart Grid Interoperability Framework

NIST having primary responsibility for interoperability standards

- **Input from**
 - FERC, OE, Smart Grid Task Force, other Federal & State agencies
 - GWAC, IEEE, NERC, NEMA, EPRI
- **Scope of framework**
 - Flexible to accommodate legacy systems
 - Technology neutral
 - Voluntary uniform standards for appliances and equipment for homes and businesses

GWAC leading the support for OE

- Held meeting with FERC Commissioner on interoperability
- Participating in the NIST Interop Framework Team meetings
- Providing GWAC developed materials, forum proceedings, and contact to help coordinate development

Interoperability Path Forward





Communications and Outreach for Public Awareness

What is the Smart Grid, E-Forum, May 19

- Planned and co-sponsored with EEI as preparatory to Smart Grid Implementaion Workshop in June
- Objective is to share emerging industry views on what constitutes a Smart Grid, with the intent to advance the understanding of this global initiative
- Follow on E-Forums likely

GridWeek 2008, September 23-25, 2008 in DC

- GridWise Alliance and OE as co-chairs
- Becoming *the* national event on smart grid
 - Enabling energy efficiency
 - Smart Grid in a carbon economy
 - Future of Energy
 - Utility operational efficiencies
 - New business models
 - Interoperability of a Smart Grid
 - Securing the Smart Grid
 - Implementing EISA 2007
 - Smart Grid Success Areas
- More than 800 attendees anticipated by the Organizing Committee





Publications for Public Awareness

Smart Grid Book

- An illustrative document on:
 - What is the Smart Grid
 - What is the value
 - Why is it necessary
 - Who are the “key” players
- Target for distribution during GridWeek 2008
- Lead Contractor: Litos Advertising & Design

Smart Grid Newsletter

www.smartgridnews.com

- Monthly on-line publications covering news, trends, research and marketplace information relevant to grid automation





OE R&D Programs Support Achieving Smart Grid Characteristics

- **Operational (system, energy) efficiency**
 - Wire development, cables, other advanced grid components
 - Distribution/substation automation
- **Self-healing and resilience from attacks**
 - Real-time monitoring, advanced algorithm development
 - Situational awareness tool
 - Advance control systems (security / interoperability)
- **Improved power quality and faster grid operations**
 - Storage technologies
 - High-voltage power electronics (switches)
 - HTS fault current limiters
- **Asset optimization, generation diversity, consumer empowerment, enabling services**
 - Integration of renewable and distributed systems
 - Plug-in hybrid electric vehicles, microgrids, demand response





OE PSA & EERE Activities Supporting Smart Grid Implementation

OE PSA Division's Assistance to States/Regions on Electricity Policies

- **National Action Plan for Energy Efficiency**
 - Does the smart grid have a role?
- **Assistance to state PUCs on advanced metering, efficiency, demand response & related Smart Grid policies**
- **Collaborate with NCSL on their Smart Grid Forum**
- **Assistance to regional PUCs efforts of MADRI, MWDRI, PNDRP on advanced metering/enabling technologies**
- **Participate in various state events (ex: NGA Clean Generation/Efficiency Forum, others)**

Office of EERE Activities

- **Renewable R&D, PHEV development, smart buildings and ZEH R&D, equipment, appliance standards**

